

**ABSTRACT**

- A method is provided for forming a graded junction in a semiconductor material having a first conductivity type. Dopant having a second conductivity type opposite the first conductivity type is introduced into a selected region of the semiconductor material to define
- 5 a primary dopant region therein. The perimeter of the primary dopant region defines a primary pn junction. While introducing dopant into the selected region of the semiconductor material, dopant is simultaneously introduced into the semiconductor material around the perimeter of the primary dopant region and spaced-apart from the primary pn junction. The dopant in both the primary dopant region and in the dopant around the perimeter of the
- 10 primary dopant region is then diffused to provide a graded dopant region. The graded dopant region thus includes an interior portion that has a first dopant gradient with a first maximum dopant concentration and a perimeter portion that is contiguous with the interior portion and has a second dopant gradient with a second maximum dopant concentration that is less than the first maximum dopant concentration.